21. (Original) The vacuum plasma processor of claim 18 wherein the first and second electrodes and the source arrangement are arranged for causing the second electrode to be at a reference potential and for simultaneously causing the source arrangement to apply the ~~several~~ three or more frequencies to the first electrode.

22. (Original) The vacuum plasma processor of claim 16 wherein the plasma excitation source arrangement includes at least one variable frequency RF source.

23. (Original) The vacuum plasma processor of claim 16 wherein the plasma excitation source arrangement includes circuitry for (a) providing an impedance match between sources of the frequencies and the plasma and (b) decoupling the frequencies associated with the different sources from each of the other sources.

24. (Canceled)

25. (Currently Amended) A vacuum plasma processor for a workpiece comprising a vacuum chamber including first and second electrodes for supplying plasma excitation fields to a region of the chamber adapted to be responsive to gas adapted to be converted into a plasma for processing the workpiece, the chamber being arranged for carrying the workpiece while the plasma exciting fields are supplied to the region, a plasma excitation source arrangement for deriving electric energy at ~~several~~

three or more frequencies, the plasma excitation source arrangement including circuitry for selectively enabling coupling of the ~~several~~ three or more frequencies to at least one of the first and second electrodes for enabling plasma exciting electric fields at the ~~several~~ three or more frequencies to be coupled to the plasma.

26. (Currently Amended) The processor of claim 25 wherein the circuitry is arranged for coupling a plurality of the frequencies to the first electrode and for coupling at least one of the frequencies to the second electrode, the at least one frequency being different from the plurality of frequencies.

27. (Original) The processor of claim 25 wherein the circuitry is arranged for (a) providing an impedance match between sources of the frequencies and the plasma and (b) decoupling the frequencies associated with the different sources from each of the other sources.

28. (Original) The processor of claim 25 wherein the plasma excitation source arrangement includes ~~several~~ three or more different frequency sources.

29. (Original) The processor of claim 28 wherein at least one of the sources has a variable frequency.

30. (Original) The processor of claim 28 wherein at least one of the sources has

a fixed frequency.

31. (Currently Amended) The processor of claim 28 wherein various combinations of the ~~several~~ three or more frequencies affect (a) the density of the plasma (b) the energy of ions in the plasma, and (c) the chemistry of the plasma.

32. (Original) The processor of claim 28 wherein at least one of the sources has a variable output power.

33. (Original) The processor of claim 25 wherein the circuitry and the chamber are arranged for preventing substantial current to flow at at least one of the plurality of frequencies to the second electrode.

34. (Original) The processor of claim 33 wherein the circuitry and the chamber arrangement for preventing substantial current to flow at at least one of the plurality of frequencies to the second electrode includes (a) a surface in the chamber at a reference potential for causing current to flow at at least one of the plurality of frequencies from the first electrode to the surface and (b) a filter arrangement of the circuitry, the filter arrangement being connected to the second electrode for preventing the substantial flow of current at at least one of the plurality of frequencies between the second electrode and the reference potential.

35. (Currently Amended) The processor of claim 25 wherein the circuitry is arranged for connecting the second electrode to a reference potential and for supplying the ~~several~~ three or more frequencies to the first electrode.

36. (Original) The processor of claim 25 wherein the circuitry is arranged for supplying the same frequency to the first and second electrodes.

37. (Currently Amended) The processor of claim 25 wherein the plasma source arrangement circuitry is arranged for simultaneously coupling the ~~several~~ three or more frequencies ~~with~~ to the electrodes.

38. (Currently Amended) The processor of claim 25 wherein the circuitry includes a controller for selectively connecting the second electrode to a reference potential during a first workpiece processing time period and for selectively supplying the same frequency to the first and second electrodes during a second work piece processing time period.

39. (Currently Amended) The processor of claim 37 wherein the controller is arranged for selectively connecting the first electrode to be responsive to each of the ~~several~~ three or more frequencies during the first time period.

40. (Original) The vacuum plasma processor of claim 25 wherein the plasma

excitation source arrangement is arranged for applying ~~several~~ three or more of the frequencies to the first electrode.

41. (Original) The vacuum plasma processor of claim 25 wherein the first and second electrodes and the source arrangement are arranged for causing the second electrode to be at a reference potential and for simultaneously causing the source arrangement to apply the ~~several~~ three or more frequencies to the first electrode.

42. (Previously Presented) A vacuum plasma processor for processing a workpiece comprising a vacuum chamber including an electrode arrangement for supplying plasma excitation fields to a region of the chamber adapted to be responsive to gas adapted to be converted into a plasma for processing the workpiece, the chamber being arranged for carrying the workpiece while the plasma excitation fields are supplied to the region, the electrode arrangement including first and second electrodes respectively on opposite first and second sides of the region and a third electrode on said first side of the region, the third electrode being peripheral to and electrically insulated from the first electrode, a plasma excitation source arrangement for deriving electric energy at plural frequencies, the plasma excitation source arrangement being arranged for selectively coupling energy at the plural frequencies to the first, second and third electrodes for causing current at at least one of the plural frequencies to flow in the third electrode without current at all of the frequencies flowing in the third electrode.

43. (Original) The processor of claim 42 wherein the electrode arrangement includes a fourth electrode on said second side of the region, the fourth electrode being peripheral to and electrically insulated from the second electrode, the plasma excitation source arrangement being arranged for selectively coupling energy to the fourth electrode for causing current at at least one of plural frequencies to flow in the fourth electrode without current at all the frequencies flowing through the fourth electrode.

44. (Original) The processor of claim 43 wherein the plasma excitation source arrangement is arranged for applying energy at at least one of the frequencies to the third electrode.

45. (Original) The processor of claim 43 wherein the plasma excitation source arrangement is arranged for applying energy at at least one of the frequencies to the fourth electrode.

46. (Original) The processor of claim 43 wherein the plasma excitation source arrangement is arranged for applying energy at at least one of the frequencies to the third and fourth electrodes.

47. (Previously Presented) The processor of claim 43 wherein the plasma excitation source arrangement includes a filter arrangement for enabling current at least

one of the frequencies to flow between the third electrode and a reference potential while preventing current at at least one of the frequencies from flowing between the third electrode and the reference potential.

48. (Currently Amended) The processor of claim 43 wherein the plasma excitation source arrangement includes a filter arrangement for enabling current at at least one of the frequencies to flow between the fourth electrode and a reference potential while preventing current at at least one of the frequencies from flowing between the fourth electrode and the reference potential.

49. (Currently Amended) The processor of claim 48 wherein the plasma excitation source arrangement includes a filter arrangement for enabling current at at least one of the frequencies to flow between the third electrode and a reference potential while preventing current at least one of the frequencies from flowing between the third electrode and the reference potential.

50. (Original) The processor of claim 42 wherein the plasma excitation source arrangement is arranged for applying energy at at least one of the frequencies to the third electrode.

51. (Currently Amended) The processor of claim 42 wherein the plasma excitation source arrangement includes a filter arrangement for enabling current at at

least one of the frequencies to flow between the third electrode and a reference potential while preventing current at least one of the frequencies from flowing between the third electrode and the reference potential.

52. – 63. (Canceled)

64. (New) The apparatus of claim 15 wherein a first of the frequencies is in the range of 100 kHz to 10 MHz, a second of the frequencies is in the range of 10 MHz to 150 MHz, and a third of the frequencies is in the range of 27 MHz to 300 MHz.

65. (New) The processor of claim 18 wherein a first of the frequencies is in the range of 100 kHz to 10 MHz, a second of the frequencies is in the range of 10 MHz to 150 MHz, and a third of the frequencies is in the range of 27 MHz to 300 MHz.

66. (New) The processor of claim 65 wherein the plasma excitation source arrangement is arranged for simultaneously applying the first and second frequencies to the first electrode while applying the third frequency to the second electrode.

67. (New) The processor of claim 66 wherein the plasma excitation source arrangement is arranged for simultaneously applying the first, second, and third frequencies to the first electrode while the second electrode is at a reference potential.

68. (New) The processor of claim 25 wherein a first of the frequencies is in the range

of 100 kHz to 10 MHz, a second of the frequencies is in the range of 10 MHz to 150 MHz, and a third of the frequencies is in the range of 27 MHz to 300 MHz.

69. (New) A vacuum plasma processor comprising a vacuum chamber including an electrode, the chamber being associated with a reactance, the electrode and reactance being arranged for coupling plasma excitation fields to gas in the chamber, the chamber being arranged for carrying a workpiece while the plasma excitation fields are coupled to the plasma, and a plasma excitation source arrangement for enabling the electrode and reactance to couple the electric energy at three or more frequencies to the plasma incident on the workpiece, the three or more frequencies being such that a first of the frequencies is in the range of 100 kHz to 10 MHz, a second of the frequencies is in the range of 10 MHz to 150 MHz, and a third of the frequencies is in the range of 27 MHz to 300 MHz.

70. (New) The vacuum plasma processor of claim 69 wherein the plasma excitation source arrangement is arranged for causing the three or more frequencies to be simultaneously applied to the plasma.

71. (New) The vacuum plasma processor of claim 69 wherein the electrode for carrying the workpiece includes a first electrode in the chamber and the reactance includes a second electrode in the chamber.

72. (New) The processor of claim 71 wherein the plasma excitation source